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FACIL:50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250
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SUBJECT: LER 88-024-00:on 881001,plant shutdown required by Tech Spec caused by leakage from RHR pump seal.
W/8 ltr.

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NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Turkey Point Unit 3	0 5 0 0 0 2 5 0	1 OF 0 3

TITLE (4) Plant Shutdown Required by Technical Specifications Caused by Leakage From Residual Heat Removal Pump Seal

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
1 0	0 1	8 8	8 8	0 2 4	0 0	1 0	3 1	8 8	N/A	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Karl W. Gross, Compliance Engineer	AREA CODE 3 0 5 2 4 6 - 6 7 4 9

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	B O	S E A L	C 6 8 1						

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On October 1, 1988 at 1408, with Turkey Point Unit 3 operating at 100 percent power, during the monthly Residual Heat Removal Pump (RHR) inservice test, seal leakage was measured to be greater than 150 drops per minute for the 3A RHR pump, resulting in declaration of the pump out of service. At 1435 the 3A RHR Pump was declared out of service. The 3B RHR pump was subsequently tested satisfactorily. The Turkey Point Technical Specifications (TS) section 3.4.1.b allows continued operation for a period of up to 24 hours with one RHR pump out of service. The replacement of a RHR pump seal was determined to require greater than 24 hours to complete. At 2006 on October 1, 1988, a normal reactor shutdown was begun. The RHR pump seal which was leaking was disassembled for examination. The specific root cause for the seal failure which led to the leakage and subsequent plant shutdown required by TS was not identified. The inspection revealed two potential causes, foreign material on the seal faces and/or installation technique weaknesses in assembly of the seal. Corrective actions include flushing the seal cooler prior to reassembly to remove foreign material and revision of the installation technique to include vendor recommendations related to the method used to assemble the seal. The RHR pump seal design currently in use will be replaced during the next refueling outage for unit 3, and during the current refueling outage for unit 4.

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NRC Form 366
(9 83)

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Turkey Point Unit 3	0 5 0 0 0 2 5 0	8 8	— 0 2 4	— 0 0	0 2 OF 0 3

TEXT (If more space is required, use additional NRC Form 366A's) (17)

Event Description

On October 1, 1988 at 1408, with Turkey Point Unit 3 operating at 100 percent power, the monthly Residual Heat Removal Pump (RHR, EIIS System Code BO, EIIS component code P) Inservice Test was begun. During the inservice test, seal (EIIS component code SEAL) leakage was measured to be greater than 150 drops per minute for the 3A RHR pump. The inservice test procedure specifies the acceptable range for seal leakage to be less than 10 drops per minute, with an alert range of 11 to 100 drops per minute provided leakage is not trending upward. At 1435 the control room was notified of the unsatisfactory test results, and the 3A RHR Pump was declared out of service. The 3B RHR pump was subsequently tested satisfactorily at 1551 with no evidence of leakage from the shaft seal. At approximately 1633 a retest of the 3A RHR pump was performed. The seal leakage was measured at approximately 95 milliliters per minute.

The Turkey Point Technical Specifications (TS) section 3.4.1.b allows continued operation for a period of up to 24 hours with one RHR pump out of service. The replacement of a RHR pump seal was determined to require greater than 24 hours to complete. At 2006 on October 1, 1988, a normal reactor shutdown was begun. The unit reached mode 3, hot standby at 2126 and mode 4, hot shutdown at 0326 on October 2, 1988. After a spare shaft seal was installed on the 3A RHR pump, the plant entered mode 5 at 0308 on October 6, 1988. The 3A RHR pump was subsequently tested with satisfactory results.

Cause of Event

The RHR pump seal which was leaking was disassembled for examination following its replacement. The specific root cause for the seal failure which led to the leakage and subsequent plant shutdown required by TS was not identified. The inspection did however reveal two potential causes, each of which has been addressed.

The inspection of the seal identified some debris on the stationary seal face. Also some small defects were observed on the rotating seal ring. Based on these observations it was determined that one postulated root cause for the seal leakage was due to debris between the rotating and stationary seal faces.

The inspection of the stationary seal ring also revealed localized blue areas on the seating surface, indicative of possible heat damage. A review of the assembly technique and consultation with the vendor identified a potential weakness in the method used for assembly of the seal. Specifically, the installation of the seal bellows may not have allowed for a proper setting time which assures proper positioning of the bellows. This could have led to a greater than required preload on the seal mating surfaces. This second potential cause is attributable to a seal installation technique weakness.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Evaluation of Event

The RHR pumps provide normal and emergency heat removal capability for low pressure cooling of the reactor coolant system. The system consists of two independent pumps and associated trains of equipment, either of which is capable of performing the design basis functions of the system. During this event, the opposite train of RHR remained operable and capable of performing its design function. Based on this information, this event did not affect the health and safety of the public.

Corrective Actions

1) Prior to reassembly of the RHR pump following seal replacement, the seal cooler was flushed to remove foreign material.

2) Maintenance Procedure 3207.2 will be revised to incorporate vendor recommendations related to the method used to assemble the seal. The procedure will be revised by November 30, 1988.

3) The seal design currently in use requires assembly in the field, and may be subject to installation difficulties as discussed above. The seal design currently in use is being replaced to address this concern, as well as unrelated issues. The new seal design is of a canister type which requires little field assembly and allows rapid installation. The seals will be replaced on Turkey Point Unit 3 and 4, A and B RHR pumps. This replacement is currently scheduled for the current refueling outage for unit 4 pumps, and the next refueling outage for unit 3 pumps. The replacement schedule is restricted by the availability of parts associated with the new seal installation.

Additional Information

No similar events have been reported.

The RHR pumps were manufactured by Ingersoll - Rand, size 8X20W, with 3:25 inch diameter Crane Type 1 mechanical shaft seals.

P. O. 14000, JUNO BEACH, FL 33408-0420

OCTOBER 3 1 1988

L-88-476
10 CFR 50.73

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 88-24
Date of Event: October 1, 1988
Plant Shutdown Required by
Technical Specifications Caused by
Leakage From Residual Heat Removal Pump Seal

The attached Licensee Event Report (LER) is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

W. F. Conway
Senior Vice President - Nuclear

WFC/RHF/gp

Attachment

cc: Malcolm L. Ernst, Acting Regional Administrator,
Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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